REMARKS

In response to the Office Action mailed November 30, 2004, Applicant respectfully requests reconsideration. To further the prosecution of this Application, Applicant submits the following remarks, has canceled claims and has added new claims. The claims as now presented are believed to be in allowable condition.

Claims 1-29, 32-40 and 43-48 were pending in this Application. By this Amendment, claims 32-33, 36-37 and 39 have been canceled without prejudice. Applicants expressly reserve the right to prosecute claims, as pending prior to this amendment, and similar claims in one or more related Applications. Claims 49-56 have been added. Accordingly, claims 1-29, 34-35, 38, 40, and 43-56 are now pending in this Application. Claims 1, 11 and 21 are independent claims.

Rejection under §102

Claims 1-29, 32-40, 43 and 45 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,425,034 (Steinmetz et al.).

Applicant respectfully traverses the rejection of claims 33, 37 and 39, and requests reconsideration. To further the prosecution of this Application, Applicant has placed claim 33 in independent form by amending claim 1 to include all of the limitations of claims 32 and 33 which originally depended from claim 1, and then canceled claims 32 and 33. Similarly, Applicant has placed claim 37 in independent form by amending claim 11 to include all of the limitations of claims 36 and 37 which originally depended from claim 1, and then canceled claims 36 and 37. Furthermore, Applicant has placed claim 39 in independent form by amending claim 21 to include all of the limitations of claim 39 which originally depended from claim 21, and then canceled claim 39.

Applicant was careful not to change the scope of claims 33, 37 and 39 when amending claims 1, 11 and 21 to respectfully include all of their limitations and the limitations of any intervening claims. Accordingly, no further searching and/or consideration is required for reconsideration of claims 1, 11 and 21.

Steinmetz discloses a host system 180 including a host bus adapter 182 (column 8, lines 46-47 and Figs. 4-5). The host bus adapter 182 interfaces between a peripheral bust 184 and a number of peripheral devices 186 through a FC 188 (column 8, lines 49-52). Steinmetz illustrates an exemplary FCP (fibre channel protocol) write operation in Fig. 3B with time clearly transpiring in the downward direction. An FCP initiator 160 transmits an FCP_CMND sequence 170 to an FCP target 162 for the write operation (column 8, lines 4-6). The FCP target 162, in turn, allocates resources and transmits an FCP_XFER_RDY sequence 172 to the FCP initiator 160 (column 8, lines 6-8). In response to the FCP_XFER_RDY sequence 172 to the FCP initiator 160, the FCP initiator 160 transmits the data as an FCP_DATA sequence 174 (column 8, lines 9-11). If the data is larger than a frame, the sequence is partitioned into several frames and sent as multiple FCP_DATA frames 174A-174N (column 8, lines 11-13).

It should be understood that, for this last statement regarding the FCP initiator 160 sending multiple FCP_DATA frames 174A-174N to have any meaning, clearly the FCP initiator 160 transmits the FCP_DATA sequence in portions one at a time, i.e., the FCP_DATA frame 174A, followed by the FCP_DATA frame 174B, and so on. There is no infrastructure illustrated in Steinmetz that could carry multiple FCP_DATA frames 174A-174N at the same time. Furthermore, even if there were such an infrastructure available to Steinmetz, there then would be no need to partition the data based on frame size. Accordingly, the only proper way to interpret this statement is that Steinmetz sends multiple FCP_DATA frames 174A-174N one at a time.

Claims 1-10, 32-35 and 43-44

Applicant wishes to remind the Patent Office that claim 1 was amended to include all of the limitations of claims 32 and 33, and then claims 32 and 33 were canceled. Applicant has not made any other amendment to claim 1. Accordingly, Applicants have not amended the claims in a manner that would require the Patent Office to provide further searching and/or consideration.

Rather, as a matter of right, Applicants simply request reconsideration of the allowability of claim 33 which is now embodied as an independent claim in claim 1.

Claim 1, as amended, is directed to a method for exchanging data with a volatile memory cache circuit which occurs in an interface circuit of a data storage system. A point-to-point channel directly connects to both the interface circuit and the volatile memory cache circuit. The method includes the step of providing a command to the volatile memory cache circuit through the point-to-point channel which directly connects to both the interface circuit and the volatile memory cache circuit. The point-to-point channel including a first link and a second link. The method further includes the steps of dividing a data element into a first half of the data element and a second half of the data element, and moving the data element through the point-to-point channel in accordance with the command, and receiving status from the volatile memory cache circuit through the point-to-point channel in accordance with the data element. The step of moving includes the step of conveying the first half of the data element through the first link and the second half of the data element through the second link. The step of conveying includes the step of transmitting the first half of the data element from a first transmitter and concurrently transmitting the second half of the data element from a second transmitter.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."[1] "The identical invention must be shown in as complete detail as is contained in the ... claim."[2]

The rejection of claim 33 (which is now embodied as independent claim 1) under 35 U.S.C. §102(e) must be withdrawn because Steinmetz does not shown the identical invention in as complete detail as is contained in that claim. For

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[1] *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

[2] *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

example, Steinmetz does not disclose a method for exchanging data with a volatile memory cache circuit which occurs in an interface circuit of a data storage system which includes, among other things, moving a data element through the point-to-point channel including a first link and a second link where moving includes conveying a first half of the data element through the first link and a second half of the data element through the second link, and where conveying includes transmitting the first half of the data element from a first transmitter and concurrently transmitting the second half of the data element from a second transmitter, as recited in claim 1. Rather, Steinmetz sends multiple FCP_DATA frames 174A-174N one at a time from an FCP initiator 160 to an FCP target 162 (see column 8, lines 4-16 of Steinmetz).

For the reasons stated above, claim 1 patentably distinguishes over the cited prior art, and the rejection of claim 1 under 35 U.S.C. §102(e) should be withdrawn. Accordingly, claim 1, which was previously claim 33, is in allowable condition.

Because claims 2-10, 34-35 and 43-44 depend from and further limit claim 1, claims 2-10, 34-35 and 43-44 are in allowable condition for at least the same reasons.

Claims 11-20, 36-38 and 45-46

Applicant wishes to remind the Patent Office that claim 11 was amended to include all of the limitations of claims 36 and 37, and then claims 36 and 37 were canceled. Applicant has not made any other amendment to claim 11. Accordingly, Applicants have not amended the claims in a manner that would require the Patent Office to provide further searching and/or consideration. Rather, as a matter of right, Applicants simply request reconsideration of the allowability of claim 37 which is now embodied as an independent claim in claim 11.

Claim 11, as amended, is directed to a method for exchanging data with the interface circuit which occurs in a volatile memory cache circuit of a data

storage system. A point-to-point channel directly connects to both an interface circuit and the volatile memory cache circuit. The method includes the step of receiving a command from the interface circuit through the point-to-point channel which directly connects to both the interface circuit and the volatile memory cache circuit. The point-to-point channel includes a first link and a second link. The method further includes the step of moving a data element through the point-to-point channel in accordance with the command, the step of moving including the step of conveying a first half of the data element through the first link and a second half of the data element through the second link, and the step of conveying including the step of receiving the first half of the data element from a first transmitter of the interface circuit and concurrently receiving the second half of the data element from a second transmitter of the interface circuit. The method further includes the steps of reconstructing the data element from the first half of the data element and the second half of the data element, and providing status to the interface circuit through the point-to-point channel in accordance with the data element.

Steinmetz does not disclose a method for exchanging data with an interface circuit which occurs in a volatile memory cache circuit of a data storage system which includes the step of moving a data element through a point-to-point channel including a first link and a second link, where the step of moving includes the step of conveying a first half of the data element through the first link and a second half of the data element through the second link, and where the step of conveying includes the step of receiving the first half of the data element from a first transmitter of the interface circuit and concurrently receiving the second half of the data element from a second transmitter of the interface circuit, as recited in claim 11.

Rather, as mentioned above in connection with claims 1 and 33, Steinmetz sends multiple FCP_DATA frames 174A-174N one at a time from an FCP initiator 160 to an FCP target 162 (see column 8, lines 4-16 of Steinmetz). Accordingly, claim 11 patentably distinguishes over the cited prior art for at least

the same reasons. As a result, the rejection of claim 11 under 35 U.S.C. §102(e) should be withdrawn, and claim 11 (which was previously claim 37) is in allowable condition.

Because claims 12-20, 38 and 45-46 depend from and further limit claim 1, claims 12-20, 38 and 45-46 are in allowable condition for at least the same reasons.

Claims 21-29, 39-40 and 47-48

Applicant wishes to remind the Patent Office that claim 21 was amended to include all of the limitations of claim 39, and then claim 39 was canceled. Applicant has not made any other amendment to claim 21. Accordingly, Applicants have not amended the claims in a manner that would require the Patent Office to provide further searching and/or consideration. Rather, as a matter of right, Applicants simply request reconsideration of the allowability of claim 39 which is now embodied as an independent claim in claim 21.

Claim 21, as amended, is directed to a data storage system having (i) a volatile memory cache circuit that buffers data elements exchanged between a storage device and a host, (ii) an interface circuit that operates as an interface between the volatile memory cache circuit and at least one of the storage device and the host, and (iii) a point-to-point channel, interconnected between the volatile memory cache circuit to the interface circuit, that carries the data elements between the volatile memory cache circuit and the interface circuit. The point-to-point channel directly connects to both the interface circuit and the volatile memory cache circuit. The point-to-point channel includes a first link configured to carry first halves of the data elements and a second link configured to carry second halves of the data elements. The interface circuit includes a first transmitter and a second transmitter configured to concurrently transmit the first and second halves of the data elements respectively through the first and second links.

Steinmetz does not disclose a data storage system having a point-to-point channel directly connecting to both an interface circuit and a volatile memory cache circuit, the point-to-point channel including a first link configured to carry first halves of data elements and a second link configured to carry second halves of the data elements, the interface circuit including a first transmitter and a second transmitter configured to concurrently transmit the first and second halves of the data elements respectively through the first and second links, as recited in claim 21.

Rather, as mentioned above in connection with claims 1 and 33, Steinmetz sends multiple FCP_DATA frames 174A-174N one at a time from an FCP initiator 160 to an FCP target 162 (see column 8, lines 4-16 of Steinmetz). As a result, claim 21 patentably distinguishes over the cited prior art for at least the same reasons. Thus, the rejection of claim 21 under 35 U.S.C. §102(e) should be withdrawn, and claim 21 (which was previously claim 39) is in allowable condition.

Because claims 22-29, 40 and 47-48 depend from and further limit claim 21, claims 22-29, 40 and 47-48 are in allowable condition for at least the same reasons.

Newly Added Claims

Claims 49-56 have been added and are believed to be in allowable condition. Claims 49-51 depend from claim 1. Claims 52-54 depend from claim 11. Claims 55-56 depend from claim 21. Support for claims 49, 52 and 55 is provided within the Specification, for example, on page 13, line 8 through page 14, line 8, and on page 15, line 26 through page 16, line 3. Support for claims 50, 53 and 56 is provided within the Specification, for example, on page 22, line 11-22. Support for claims 51 and 54 is provided within the Specification, for example, on page 11, lines 6-21. No new matter has been added.

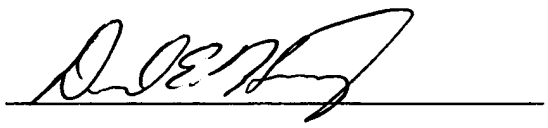
Conclusion

In view of the foregoing remarks, this Application should be in condition for allowance. A Notice to this affect is respectfully requested. If the Examiner believes, after this Amendment, that the Application is not in condition for allowance, the Examiner is respectfully requested to call the Applicant's Representative at the number below.

Applicant hereby petitions for any extension of time which is required to maintain the pendency of this case. If there is a fee occasioned by this Amendment, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 50-0901.

If the enclosed papers or fees are considered incomplete, the Patent Office is respectfully requested to contact the undersigned collect at (508) 366-9600, in Westborough, Massachusetts.

Respectfully submitted,



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